First order for EpiTT/VCSEL confirmed by a lead user

VCSELs grown on GaAs are currently emerging as a leading technology in rapidly expanding markets like Gesture Recognition, 3D imaging, datacomm and others. Following the request of our customers and utilizing the modular concept of our new Gen3 in-situ platform, LayTec has customized and expanded the related in-situ metrology performance for VCSEL epitaxy. In May, one of our lead users in Europe placed the first order for such a system called EpiTT/VCSEL. The tool will be shipped by the beginning of 2017.

EpiTT/VCSEL contains two fiber optical heads: one for a standard EpiTT and one for spectral reflectance sensing (R-VCSEL). Both can be mounted via an adapter flange on an EpiCurve® head making an EpiCurve®TT/VCSEL system as shown in Fig. 1. This allows integrating the full EpiCurve®TT performance with the spectral monitoring of DBR stop-bands and cavity dip position. In Fig. 1 this 4-in-1 metrology tool is mounted on an Aixtron G3 Planetary reactor top. EpiTT/VCSEL and EpiCurve®TT/VCSEL are powered by new software modules that enable both single-pocket and multi-pocket operation. Learn more at laytec.de/VCSEL.

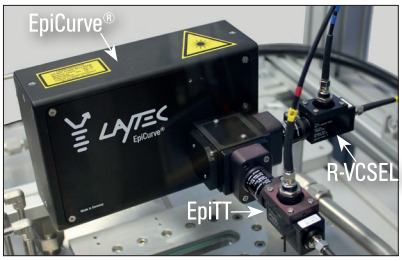

Fig. 1: EpiCurve®TT/VCSEL – the four dimensions for VCSEL epi: measured feature #1 – wafer temperature (EpiTT head), #2 – growth rates (EpiTT head), #3 – wafer bow (EpiCurve® head), #4 – spectral reflectance (R-VCSEL head) – all sensing through the purged view-port of an Aixtron G3 reactor.

EpiTT for UV-C LEDs: 280 nm reflectance senses AlGaN surface morphology

AlGaN buffer layers with high Aluminum content are necessary for optimal UV-C LED performance. But their Band-Edge lies below 300 nm, so the established 405 nm in-situ reflectance is insensitive to the surface morphology of such AlGaN layers. To monitor precisely both AlGaN growth rate and surface morphology during UV-C LED epitaxy, LayTec offers an additional 280 nm reflectance channel that employs a UV-C LED as a light source. Fig. 2 shows the results measured in-situ during the growth of an AlGaN layer: The Fabry-Perot oscillations of the final AlGaN layer are damping out because the band edge of the material shifts toward longer wavelength at the growth temperature. The small reflectance reduction at 12000 s indicates a small roughening of the AlGaN surface. The green line delivers the high-resolution wafer bow data (see the article below). This study is supported by Advanced UV for Life funding (grant number 03ZZ0105C, BMBF). Find more about in-situ metrology for UV LEDs at www.laytec.de/UVLED.

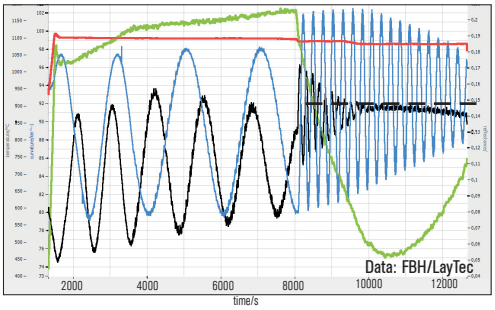

Fig. 2: Growth of AlN/AlGaN(60%Al) on a Sapphire/AlN template in Aixtron CCS 6x2 reactor: black – 280 nm reflectance; blue – 405 nm reflectance; green – high-resolution wafer bow; red – true temperature.

EpiCurve®TT Gen3: high resolution wafer bow measurements for CCS reactors

Detecting thin-film strain in-situ during epi growth through the tiny openings of the showerhead view-ports is a challenge. However, with our advanced software algorithms we have further improved the signal-to-noise ratio of EpiCurve®TT by a full order of magnitude. The wafer bow data in Fig. 2 (green line) shows that the wafer curvature noise in this Close Coupled Showerhead® (CCS) reactor is now down to 0.3km^{-1}. With this improvement, in-situ strain balancing or AlGaN lattice constant tuning (Fig. 2, strain changes from compressive towards tensile during AlGaN growth at ~1000 s) is now possible with accuracy levels formerly known only for ex-situ XRD methods.

AIXTRON qualifies LayTec EpiNet 2016 software

We are proud to announce that AIXTRON SE has qualified EpiNet 2016, LayTec's latest control and analysis software for EpiTT and EpiCurve® TT products. EpiNet 2016 is all about turning your metrology system's in-situ data into high-level information. Dr. Christian Geng, Director of Technology at AIXTRON SE, said: "With EpiNet 2016, our customers have access to key features of LayTec Gen3 metrology tools on our AIXTRON's MOCVD platform. The improved performance and related customized upgrade packages of EpiNet 2016 will add further values to AIXTRON driven epitaxy processes." For more information about EpiNet 2016 extended analysis capabilities and features please contact info@laytec.de.

You can meet us at the following workshops, conferences and trade fairs:

4–8 July 2016 | ICEM 2016 | Suntec, Singapore | Talk: In-situ Metrology for Advanced Device Fabrication in Semiconductor Epitaxy

10–15 July 2016 | ICMOVPE-XVIII | San Diego, CA, USA | Booth 11

11 July 2016 | LayTec In-situ Seminar in conjunction with ICMOVPE | San Diego, CA, USA | You are welcome to register for our seminar here >